John M. Campbell & Co.

Exclusive provider of PetroSkills facilities training.

Who Should Attend?

Mechanical, facilities, plant or pipeline engineers and piping system designers who are involved in the design of in-plant piping systems for oil and gas facilities.

The Participant Will Learn:

- ❑ Apply piping system codes and standards
- ❑ About line sizing and layout of piping systems in various types of facilities
- ❑ How to specify proper components for process and utility applications
- ❑ Compare alternative materials of construction
- ❑ The process of steelmaking, pipe manufacturing and material specifications
- ❑ Joining methods and inspection techniques
- ❑ Key considerations for flare and vent systems, including PSV sizing

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Piping Systems - Mechanical Design and Specification (ME-41)

Course Outline

Daily schedule is approximate.

DAY 1

- Steel Making
  - Processes
  - Basic Metallurgy of Carbon Steel
- Pipe Manufacturing
  - Processes-Seamless, ERW, SAW
  - Testing
  - Specifications
- Welding and Inspection
  - Processes-Stick, TIG, MIG
  - Procedures and Qualification
  - Inspection
  - Heat Treatment

DAY 2

- Piping Specifications
  - Codes and Standards
  - Design-wall thickness calculations
  - Components-flanges, gaskets, fittings
  - Piping Specification Sheets
- Line Sizing
  - Bernoulli's Equation
  - Liquid Flow-Darcy Equation
  - Friction factors
  - Gas Flow Equations
  - Guidelines and Design Criteria

DAY 3

- Multiphase Flow
  - Two-phase Hydraulics
  - Flow Regimes
  - Modified Flannigan Correlation
  - Slugging and Slug Catchers
- Pipeline Operations and Maintenance
  - Transportation Costs
  - Technical Factors
  - Operating Plan
  - Cathodic Protection
- Drawings
  - Types
  - Symbols
  - Process and Mechanical
  - Plant Layout
  - Piping Drawings

DAY 4

- Inplant piping
  - Fixed Equipment Layout
  - Pump and Compressor Layout
  - Piping Routing and Valves
  - Pipe Racks
  - Stress Analysis
- Valves and Actuators
  - Services and Standards
  - Types and Applications
  - Pressure Drop Through Valves
  - Actuators-Types and Selection
- Non-Metallic Piping
  - Advantages and Limitations
  - Thermoplastics-polyethylene, polypropylene
  - Thermosetting-fiberglass
  - Design considerations
  - Joining

DAY 5

- Flare and Relief Systems
  - Codes and Standards
  - Pressure Relief Valves-types and sizing
  - Flare Systems
  - Design Considerations

About the Course:

This five-day foundation level course for engineers and piping system designers reviews the key areas associated with the design of piping systems for oil and gas facilities. The course is focused on four areas: codes and standards, pipe materials and manufacturing, piping components, and piping layout and design. Applicable piping codes for oil and gas facilities (ISO, B31.3, B31.4, B31.8, etc.), pipe sizing calculations, pipe installation, and materials selection are an integral part of the course. The emphasis is on proper material selection and specification of piping systems.